



Entergy Nuclear Operations, Inc.  
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March 10, 2008

10 CFR 50.73(a)(2)(iv)(A)

U. S. Nuclear Regulatory Commission  
ATTN: Document Control Desk  
Washington, DC 20555-0001

Palisades Nuclear Plant  
Docket 50-255  
License No. DPR-20

Licensee Event Report 08-001, Reactor Protection System and Auxiliary Feedwater  
System Actuation

Dear Sir or Madam:

Licensee Event Report (LER) 08-001 is enclosed. The LER describes a manual actuation of the reactor protection system and an automatic actuation of the auxiliary feedwater system. The occurrence is reportable in accordance with 10 CFR 50.73(a)(2)(iv)(A).

Summary of Commitments

This letter contains no new commitments and no revisions to existing commitments.

*YPKwini CJSchwarz*

Christopher J. Schwarz  
Site Vice President  
Palisades Nuclear Plant

Enclosure (1)

CC Administrator, Region III, USNRC  
Project Manager, Palisades, USNRC  
Resident Inspector, Palisades, USNRC

**ENCLOSURE 1**

**LER 08- 001**

**Reactor Protection System and Auxiliary Feedwater System Actuation**

**3 Pages Follow**

<b>NRC FORM 366</b> <b>U.S. NUCLEAR REGULATORY COMMISSION</b> (9-2007)		<b>APPROVED BY OMB NO. 3150-0104</b>		<b>EXPIRES 8/31/2010</b>																					
<h2 style="margin: 0;">LICENSEE EVENT REPORT (LER)</h2> <p style="font-size: small; margin-top: 10px;">(See reverse for required number of digits/characters for each block)</p>																									
<b>1. FACILITY NAME</b> PALISADES NUCLEAR PLANT			<b>2. DOCKET NUMBER</b> 05000255		<b>3. PAGE</b> 1 OF 3																				
<b>4. TITLE</b> Reactor Protection System and Auxiliary Feedwater System Actuation																									
<b>5. EVENT DATE</b>		<b>6. LER NUMBER</b>		<b>7. REPORT DATE</b>																					
MONTH	DAY	YEAR	YEAR	SEQUENTIAL NUMBER	REV NO																				
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<b>9. OPERATING MODE</b>  <div style="text-align: center; font-size: 24px; margin-top: 20px;">1</div> <div style="text-align: center; font-size: 24px; margin-top: 20px;">100</div>		<b>11. THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §:</b> (Check all that apply)																							
		<input type="checkbox"/> 20.2201(b) <input type="checkbox"/> 20.2203(a)(3)(i) <input type="checkbox"/> 50.73(a)(2)(i)(C) <input type="checkbox"/> 50.73(a)(2)(vii)																							
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<b>12. LICENSEE CONTACT FOR THIS LER</b>																									
[Redacted]			TELEPHONE NUMBER (Include Area Code) (269) 764-2463																						
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<b>14. SUPPLEMENTAL REPORT EXPECTED</b>																									
<input type="checkbox"/> YES (If yes, complete 15. EXPECTED SUBMISSION DATE) <input checked="" type="checkbox"/> NO																									
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<b>ABSTRACT</b> (Limit to 1400 spaces, i.e., approximately 15 single-spaced typewritten lines)																									
<p>On January 13, 2008, with the plant in Mode 1 at 100% power, main feedwater pump P-1B tripped unexpectedly. Operators entered the loss of main feedwater procedure and appropriately carried out the procedurally directed action to manually trip the reactor. As expected, the auxiliary feedwater system started automatically to recover steam generator level.</p> <p>The immediate cause of the main feedwater pump trip was low lube oil pressure. The low lube oil pressure resulted from the loss of the main feedwater pump's shaft-driven lube oil pump, which occurred when its drive coupling became disengaged. An incorrect shaft key allowed the lower hub to slide down the shaft, making only partial engagement with the sleeve. The partial tooth engagement between the lower hub and sleeve was not sufficient to withstand the shaft torque, which ultimately resulted in stripping the splines on the coupling sleeve and decoupling the lube oil pump's shaft drive.</p> <p>The lube oil pump was rebuilt, incorporating a design change that added a spacer beneath the lower hub to prevent the hub from sliding down the shaft and losing engagement with the coupling sleeve. The event is reportable in accordance with 10 CFR 50.73(a)(2)(iv)(A) as an event that resulted in an actuation of both the reactor protection system and the auxiliary feedwater system.</p>																									

(9-2007)

# **LICENSEE EVENT REPORT (LER) CONTINUATION SHEET**

1. FACILITY NAME	2. DOCKET	6. LER NUMBER			3. PAGE
PALISADES NUCLEAR PLANT	05000255	YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	2    of    3
		2008	- 001	- 00	

## **EVENT DESCRIPTION**

On January 13, 2008, with the plant in Mode 1 at 100% power, main feedwater pump P-1B [P;SJ] tripped unexpectedly. Operators entered the loss of main feedwater procedure and appropriately carried out the procedurally directed action for loss of a main feed pump at >80% power, which is to manually trip the reactor [RCT;AB]. As expected, the auxiliary feedwater system [BA] started automatically to recover steam generator [SG;AB] level.

The event is reportable in accordance with 10 CFR 50.73(a)(2)(iv)(A) as an event that resulted in an actuation of both the reactor protection system [JC] and the auxiliary feedwater system.

## **CAUSE OF THE EVENT**

The immediate cause of the main feedwater pump trip was low lube oil pressure. The low lube oil pressure resulted from the loss of the main feedwater pump's shaft-driven lube oil pump, which occurred when its drive coupling became disengaged.

The drive coupling is a vertically oriented sleeve, which mates upper and lower drive hubs. The inner surface of the sleeve is machined with splines to mesh with teeth that are machined on the outside surface of the drive hubs. The upper hub is secured to its shaft via an interference fit. The lower hub is not an interference fit, and was previously secured by a key with a projection, which served to maintain the hub in vertical position by preventing the hub from sliding down its shaft past the projection.

Investigation revealed that the installed key for the lower hub did not have the desired projection. At an unknown time in the past, the lower hub key was either replaced with one that had no projection, or the original projection on the key was removed. Pump component descriptions and drawings did not show the desired shape of the key, which allowed an incorrect key for this application to be installed. Without the correct key, the lower hub was able to slide down the shaft, making only partial engagement with the sleeve.

The partial tooth engagement between the lower hub and sleeve was not sufficient to withstand the shaft torque, which ultimately resulted in stripping the splines on the coupling sleeve and decoupling the lube oil pump's shaft drive. The partial engagement configuration existed from October 30, 2007, when the lube oil pump was installed and the main feedwater pump was placed in service, until its failure on January 13, 2008.

**LICENSEE EVENT REPORT (LER)  
CONTINUATION SHEET**

1. FACILITY NAME	2. DOCKET	6. LER NUMBER			3. PAGE
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**CORRECTIVE ACTIONS**

The lube oil pump was rebuilt, incorporating a design change that added a spacer beneath the lower hub to prevent the hub from sliding down the shaft and losing engagement with the coupling sleeve.

The feedwater pump work instructions will be upgraded to include detailed vendor drawings and information.

**SAFETY SIGNIFICANCE**

The event is considered to be of very low safety significance. All safety systems functioned as expected.

**PREVIOUS SIMILAR EVENTS**

None